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Description

METHOD OF DEVELOPING A PRODUCT WHILE ~~TAKING INTO~~  
~~CONSIDERATION~~ CONSIDERING QUALITY FEATURES OF THE  
PRODUCT ~~TO BE ESTABLISHED~~

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CLAIM OF PRIORITY

This application claims priority to Application No.  
01100514.7 which was filed in the German language on  
January 9, 2001.

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TECHNICAL FIELD OF THE INVENTION

The invention relates to a method of developing a product while taking into consideration quality features of the product to be established.

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~~Characteristic sales values which relate at least to the intended sales region are established for the product to be developed. In the method, furthermore, the characteristic product quality values to be satisfied by the product are established, consideration being given to the regulations and guidelines arising from the characteristic sales values. At least two components which are to be included in the product are defined for the product.~~

25

BACKGROUND OF THE INVENTION

To be able to sell products, it is necessary that these products they satisfy the legal regulations and guidelines which apply in the respective sales region.

30

If the products are to be sold to customers who impose their own requirements and guidelines on such products, it is necessary that the respective product also satisfies these regulations and guidelines. Such requirements may be, for example, accident prevention regulations, vehicle registration regulations,

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requirements in terms of fire behavior, earthquake safety and electromagnetic compatibility (EMC), safety regulations, works standards and environmental protection regulations.

For example, to be able to use screens of personal computers at video workstations in Germany, the screen must satisfy the characteristic values established in the internationally recognized TCO standards of the 5 Swedish central organization of professional employees, since compliance with the TCO standards is also prescribed in Germany. Such a screen must also undergo a CE test procedure, in which the screen is tested for electromagnetic compatibility and interference 10 immunity.

Furthermore, the screen should undergo equipment safety testing by the appropriate trade association, in 15 Germany the VDE or the TÜV, a test sticker attesting to the safety of the equipment being awarded if the characteristic values of the equipment safety test are met. If operation of the screen in a power-saving mode is intended, the screen should conform to the standards and provisions of the American Environmental Protection 20 Agency EPA, which are recognized as an international standard and according to which the screen must have a maximum power consumption of 30 watts in the power-saving mode. If it conforms to these standards and provisions, the screen is given what is known as an 25 Energystar test sticker.

For switching the monitor over to the power-saving mode, the internationally applicable DPMS (Digital Power Management Signaling) standards and provisions of 30 the VESA (Video Electronics Standard Association) should be taken into consideration. Such standardization ensures that the power management system of the screen can also be switched to the power-saving mode with the aid of a screen driving board, the 35 output signals of which correspond to the DPMS standards and provisions of the VESA. The DPMS standards and provisions also include, for example, the type and color of a voltage supply monitoring display and the state of such a display.

If such a screen is to be sold not only in Germany but also in the USA, the UL construction regulations for electronic equipment applicable in the USA must be additionally taken into consideration. If, however, 5 such a screen is to be sold and used in an area with a subtropical climate, the increased requirements for the climatic resistance of the screen, in particular in respect of the increased atmospheric humidity and temperature of the ambience, must be taken into 10 consideration during the development of the screen.

During the development of air-conditioning systems for motor vehicles, ~~it~~ certain requirements must be taken into consideration ~~for~~. For example ~~that~~ in certain 15 sales areas, for example in Germany, no refrigerant containing chlorofluorocarbons may be used.

In the case of devices used for encoding data, different encoding algorithms are legally prescribed, 20 for example, in the USA than in India. If the type of encoding method is not legally prescribed for a particular application and/or in a sales area, they may be prescribed for example by guidelines of possible customers. Major companies ~~and concerns~~ have their own 25 regulations and guidelines which have to be met by suppliers. For example, Deutsche Telekom AG has its own guidelines for telecommunication equipment, with the designation 1TR9. ~~What are known as works~~ Work standards, comprising guidelines and standards which 30 suppliers have to meet, are also widespread in other branches of industry, such as the chemical industry or the automobile industry for example.

If the products to be developed are to be used and sold 35 in countries in which ~~it is prescribed that~~ the components of the product must be manufactured by indigenous manufacturers, this must also be taken into consideration ~~already~~ during the product development. For example, ~~it is customary that~~ in the case of state-owned 40 telephone companies and public invitations to

tender, regulations which compulsorily prescribe indigenous manufacturers for the components used apply.

5 In ~~known methods for the quality assurance of products~~ to be developed, it is often the case that the fully developed products do not meet all the quality requirements. In order ~~nevertheless~~ to satisfy all the quality requirements, cost-intensive subsequent improvements of the products, even including the 10 exchange of entire components, are required.

#### SUMMARY OF THE INVENTION

15 ~~The object of the invention is to provide disclosures~~ a method of developing a product in which the characteristic quality values of the product satisfy the decisive regulations and guidelines.

20 ~~This object is achieved for a method of developing a product by the features of claim 1. Advantageous embodiments of the invention are specified in the dependent claims.~~

25 ~~A method with the features of claim 1 makes it possible for the regulations and guidelines arising from the characteristic sales values to be taken into consideration already during product development.~~

30 ~~Furthermore, by this method, every In one embodiment, each component of the product is tested in such a way that the characteristic product quality values to be satisfied, arising from the regulations and guidelines, are achieved even when this this component is combined with further additional components. The components are modified already during the development in such a way~~

35 ~~that they satisfy the established characteristic product quality values. A subsequent Subsequent improvement of the components is consequently not necessary once the development of the product has been completed, since the characteristic values of the developed product already satisfy all the relevant~~

regulations and guidelines. ~~It is also possible by this~~  
~~This~~ method ~~to take also allows for~~ a decision already  
~~to be made~~ during the development of the product as to  
whether different embodiments of the product are to be  
5 developed for different sales regions, or whether a  
product which satisfies all the requirements,  
regulations and guidelines which arise from the  
established characteristic sales values is developed.  
The characteristic product quality values represent  
10 desired values and the current determined  
characteristic component and/or product quality values  
represent actual values. ~~With the aid of the method~~  
~~according to patent claim 1, a~~ A set-value/actual-value  
15 comparison is carried out in the manner of a control  
loop. The modification of the respective component or  
components is the manipulated variable of the control  
loop. The control is carried out until the actual  
values have at least reached the desired values.

20 In one embodiment of the invention, the characteristic  
product quality values are determined from the ~~possibly~~  
~~modified~~ modifiable characteristic component quality  
values using a method of evaluation, with empirical  
estimating methods, mathematical models and simulation  
25 methods being used for example as methods of  
evaluation. If modified characteristic component  
quality values have been determined, the characteristic  
product quality values are determined from them using  
the method of evaluation. This achieves the effect  
30 that characteristic product quality values which can be  
compared with the characteristic product quality values  
to be satisfied are determined, the product satisfying  
all the relevant regulations and guidelines if the  
result of the comparison is positive.

35 In a ~~further~~ another embodiment of the invention, the  
characteristic product quality values are determined by  
direct measuring and/or testing on the product. In  
comparison with the characteristic product quality  
40 values determined from the characteristic component

quality values, the characteristic product quality values determined by measurements and/or tests offer greater accuracy for the characteristic product quality values actually achieved.

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In an advantageous embodiment of the invention, the components are hardware components and/or software components. ~~It is consequently ensured that all~~ Hence, the characteristic product quality values which are influenced by hardware components and/or software components are correctly determined.

10 In another embodiment of the invention, characteristic quality variables possible manufacturers of the individual components are also taken into consideration in the definition of the components. Such characteristic quality variables are, for example, the performance capability, the commercial situation and/or the quality of manufactured products of the respective manufacturer. The determination of the characteristic quality values of the manufacturers may be carried out with the aid of a questionnaire, which also contains information on the established characteristic product quality values for the product to be developed.

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30 The respective possible manufacturer may declare, for example, on the questionnaire that there are possibilities for tests which adequately demonstrate that the established characteristic product quality values are met and that said the manufacturer will carry out this test if commissioned with an order to do so. Consequently, it is ensured that the component manufactured by this manufacturer satisfies the established characteristic product quality values. The manufacturer may also declare its readiness, if commissioned with an order to manufacture a component, to carry out the necessary tests and possibly necessary modifications of the component to satisfy the established characteristic product quality values.

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The respective manufacturer should also declare before conclusion of a contract its readiness to surrender to the commissioning agent documentation on the determined characteristic component quality values and/or the 5 determined characteristic product quality values soon after they are determined, and to allow such documentation to be passed on to third parties, in particular to final customers. ~~It is consequently not only ensured that~~ Hence, the established characteristic 10 product quality values are met and satisfied ~~but also possible to provide~~ and documentation is provided to third parties, for example test agencies and final customers, showing that there is compliance with regulations and guidelines.

15 In another advantageous embodiment of the invention, the ~~possible~~-manufacturer of the component names at least one contact who will be available during the determination of the characteristic product quality 20 values and, if need be, provide support for the determination of the characteristic product quality values in subsequent testing and modification of the component. This ensures that the manufacturer of the component provides active support in satisfying the 25 established characteristic product quality values.

In a further embodiment of the invention, ~~it is taken into~~ consideration ~~during~~ is given the definition of the component and/or when establishing the possible 30 manufacturers that there are at least two manufacturers who can manufacture the respective component. ~~This achieves the effect that~~ Therefore, if there are problems with one manufacturer, there is another manufacturer which can supply the respective component. 35 This excludes any dependence on a single manufacturer. It also allows a more favorable price-performance ratio to be achieved in contract negotiations.

40 ~~It is advantageous if, in a further~~ In another embodiment of the invention, in the event that the

components of the product are to be manufactured by more than one manufacturer, a manufacturer responsible for meeting the established characteristic product quality values is established. This achieves the 5 effect that the responsibilities are clearly defined, thereby avoiding problems of accountability between the individual manufacturers.

Furthermore, it is advantageous that ~~it is~~ is 10 ~~contractually agreed with~~ if the manufacturer of the respective component at least that the established contractually agrees that at least establishes 15 characteristic product quality values will be met and/or characteristic component quality values which arise for the respective component from the characteristic product quality values will be met. This ensures that the established characteristic product quality values and the characteristic component quality values arising for the respective component 20 from the characteristic product quality values will be met without extra costs.

In a ~~further~~ another embodiment of the invention, the determined characteristic quality values are confirmed 25 by an accredited test laboratory. This ~~achieves the~~ effect that the characteristic The quality values are therefore correctly determined with adequate accuracy under the conditions presented in the guidelines and regulations. The recognition of these determined 30 values also by possible customers, approval registration agencies and inspection associations is consequently ensured.

In another embodiment of the invention, the characteristic product quality values are not 35 determined by direct measurement and/or testing if ~~it~~ is not only ~~the case that~~ the individual components satisfy the established characteristic product quality values but it is also unlikely that the components will 40 influence one another. This achieves the effect that

the characteristic component quality values of the component are determined without verifying whether the determined characteristic component quality values reach the established characteristic product quality values even when this component is combined with the further component. In particular ~~in the case of~~, components for which it is improbable or impossible that they will influence one another in a way causing the characteristic product quality values to be exceeded, it is possible to dispense with the laborious determination of the characteristic product quality values and/or the laborious determination of the characteristic component quality values while taking into consideration the influences of other components. A relatively high amount of expenditure in terms of work, cost and time can be avoided in this way.

It is also advantageous if, when establishing the characteristic quality values, characteristic values for CE marking, for UL approval, for NEBS approval, country-specific standards, in particular on earthquake safety, on the permissible fire load and on electromagnetic compatibility, environmental protection regulations and/or special customer requirements for characteristic quality values are taken into consideration. This achieves the effect that the relevant regulations and guidelines are already taken into consideration during the product development.

It is also advantageous to archive the characteristic product quality values determined and/or arising for the product from the characteristic component quality values and/or to produce certificates showing that the characteristic product quality values are met. This provides verifiable documentation showing that the characteristic product quality values are met.

In an advantageous embodiment of the invention, characteristic component quality values are determined from a component which ~~contains~~ includes a number of

subcomponents. This achieves the effect that the characteristic component quality values of subassemblies which contain subcomponents comprising the product can be determined.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the invention emerge from the following description, which explains the invention on the basis of exemplary embodiments in 10 conjunction with the attached drawings, in which:

15 figure Figure 1 shows a block diagram in which the product is schematically represented with the components contained included in the product and with the influences of the sales components.

20 figure Figure 2 shows a block diagram of a radio telephone which contains includes a number of components.

25 figure Figure 3 shows a flow diagram in which a method steps for developing a product while taking into consideration quality features of the product to be established are represented, and.

30 figure Figure 4 shows the block diagram of a data processing installation which contains includes a number of components.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

35 The invention relates to a method of developing a product while taking into consideration quality features of the product to be established. Characteristic sales values which relate at least to the intended sales region are established for the product to be developed. In the method, the characteristic product quality values to be satisfied 40 by the product are established, consideration being

given to the regulations and guidelines arising from the characteristic sales values. At least two components which are to be included in the product are defined for the product.

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Represented in figure 1 is a block diagram which shows the major decision criteria for product development. A company management, denoted by 10, takes a decision to develop a certain—product 20. When taking this decision, the management 10 also takes the decision on characteristic sales values, concerning in particular the sales region and potential customers. These characteristic sales values result in market requirements 12, customer requirements 14, local requirements 16 and also guidelines and regulations 18, which are to be taken into consideration during the development of the product 20. Hardware and software components are defined for the product 20 to be developed. This may involve defining hardware components 22 to be newly developed, already existing hardware components 24, existing hardware components 26 which have to be adapted for use in the product 20 to be newly developed, software components 28 to be newly developed and/or software components 30 which have to be adapted for use in the product 20 to be newly developed. During the definition of the product components 22, 24, 26, 28, 30, the quantifiable market requirements 12 are taken into consideration when defining the product components 22, 24, 26, 28, 30 and when establishing the characteristic product quality values.

Furthermore, the customer requirements 14 for the product to be newly developed are taken into consideration during the definition of the components 22 to 30. These customer requirements 14 may concern, for example, regulations of possible major customers and/or consumer behavior, for example the color, shape and/or accustomed operating practices of possible individual customers, in the respective sales region.

The local requirements 13, which concern for example the climatic conditions and/or the frequency of earthquakes and also the possible places where possible customers will choose to use the product 20 to be 5 developed, ~~must~~ are also be taken into consideration.

The guidelines and regulations 18 applicable in the respective sales region are also taken into consideration during the definition of the components 10 22, 24, 26, 28, 30. Such guidelines and regulations 18 concern in particular regulations which apply in the respective sales region as a result of statutory provisions, such as for example laws and ordinances on environmental protection, the standards and guidelines 15 for the approval of products, or as a result of the recognized rules of the art. The product ~~must~~ should satisfy the necessary characteristic product quality values resulting from the requirements 12, 14, 16, 18 to allow it to be sold as intended in the respective 20 sales region. The management 10 can, however, also establish characteristic product quality values for the product 20 to be developed which more than satisfy the characteristic product quality values resulting from the necessary requirements 12, 14, 16, 18, for example 25 in order to develop a product 20 of a high quality.

During the definition of the components 22 to 30, at least one possible manufacturer for each individual component 22 to 30 is also established, aiming to 30 obtain at least two possible manufacturers for a component. In the decision on the possible manufacturers, the commercial situation and/or the quality of manufactured products of the respectively possible manufacturer must also be taken into 35 consideration. In contract negotiations with possible manufacturers, an assessment of the respective possible manufacturer should be carried out with the aid of a questionnaire, which also includes information on the established characteristic product quality values.

- The respective possible manufacturer should also declare on this questionnaire that it has the possibility of carrying out tests which adequately demonstrate that the established characteristic product quality values are met and that said manufacturer will carry out these tests if commissioned with an order to do so. It should also declare its readiness to carry out any possibly necessary modifications and renewed tests of the component 22 to 30. Before or when a contract is concluded, the possible manufacturer ~~must~~ should also declare that it will surrender to the commissioning agent documentation on the determined characteristic component quality values and/or the determined characteristic product quality values, and that it will allow the data ~~contained~~ included in the documentation to be passed on to third parties, for example to final customers. It will also name at least one contact who will be available during the determination of the characteristic product quality values and, if need be, provide support for the determination of the characteristic product quality values in subsequent testing and the modification of the component 22 to 30.
- If a number of manufacturers are envisaged for manufacturing the components 22 to 30, a manufacturer responsible for meeting the established characteristic product quality values is established. The manufacturers of the components 22 to 30 then have to agree with one another on how the established characteristic product quality values are satisfied. ~~All~~ The determined characteristic quality values should be confirmed by an accredited test laboratory.
- In individual cases, it is possible to dispense with the determination of the characteristic product quality values while taking into consideration the influences of further components 22 to 30, if the individual components 22 to 30 satisfy the established characteristic product quality values and it is

unlikely that the components 22 to 30 will influence one another.

For example, in Germany there is currently no 5 requirement covering a data processing installation which includes a personal computer, a screen, a keyboard and a computer mouse to determine the characteristic product quality values of the entire data processing installation. In such a case, it is 10 adequate if the individual components, i.e. the personal computer, the screen, the keyboard and the computer mouse, each satisfy the characteristic product quality values and that the characteristic component quality values of the personal computer, the screen, 15 the keyboard and the computer mouse satisfy the established characteristic product quality values of the data processing installation, while it is unlikely for the characteristic product quality values to be surpassed by the characteristic component quality 20 values even when the components are being used in the intended way with further components of the data processing installation.

The individual components, such as the personal 25 computer, the screen, the keyboard and the computer mouse, may in this case each comprise a number of subcomponents. A personal computer includes, for example, a power supply unit, a hard disk drive, a floppy disk drive, a CD-ROM drive, a main board, a 30 central arithmetic and logic unit, main memory modules, screen driver boards, sound cards and components for remote data transmission. A screen also ~~contains~~ includes a number of subcomponents, such as for example a high-voltage unit, a power supply unit, a control 35 unit, a cathode-ray tube, an input unit, software which can be run by the control unit, and a housing.

When establishing the characteristic product quality values, characteristic values for CE marking, for UL 40 approval, for NEBS approval, country-specific

standards, in particular on earthquake safety, on the permissible fire load and on electromagnetic compatibility, and/or special customer requirements for the characteristic quality values should be taken into  
5 consideration. The characteristic product quality values determined and/or arising for the product from the characteristic component quality values are archived, and certificates showing that the characteristic product quality values are met are  
10 produced.

Represented in figure 2 is a radio telephone 40, which includes a number of components. The radio telephone 40 includes a housing 42, an antenna unit 44, a  
15 transmitting unit 46, an input unit 48, a display unit 50, a tone-signaling unit 52, a vibration-signaling unit 54, a central arithmetic and logic unit 56, a memory unit 58, a chip-card reading/writing unit 60, a chip card 62, a battery control unit 64 and a battery  
20 66. The radio telephone 40 is in this case a product to be developed, like the product to be developed which is denoted by 20 in figure 1. The management 10 decides that a new radio telephone 40 is to be developed. This decision also includes the intended  
25 sales region for the radio telephone 40.

In accordance with an existing market analysis or a market analysis to be produced, technical parameters and functional parameters of the radio telephone 40 are  
30 established. Such a market analysis may also include the analysis of rival products sold in this sales region. When establishing the functions and technical parameters, further customer requirements, such as for example requirements of the mobile telephone network  
35 operators active in the sales region, are taken into consideration. Local requirements, such as for example special climatic and geographical conditions of the intended sales region, are also taken into consideration. Furthermore, the statutory provisions,  
40 in particular regulations on protection against

tapping, on emergency call functions, on radio traffic, telecommunication laws, environmental protection laws and guidelines on electromagnetic compatibility, must should be taken into consideration. With the aid of

5 these requirements, characteristic product quality values for the radio telephone 40 are established. These characteristic product quality values take into consideration all the requirements imposed on the radio telephone 40.

10

If, for example, the radio telephone 40 is to be operated in the European Union and in the USA, the different transmitting and receiving frequencies and the different mobile telephone standards must should

15 also be taken into consideration for example. The management 10 can decide in such a case whether the radio telephone 40 is to be developed in such a way that transmission and reception of telecommunication data is to be possible in a switchable manner on all

20 the frequencies possible in the intended sales region or whether an embodiment of the radio telephone 40 is to be developed for each of the possible transmission and reception frequencies. The requirements imposed on the radio telephone 40 to be developed, resulting from

25 the market requirements 12, the customer requirements 14, the local requirements 16 and also the statutory guidelines and regulations 18, consequently represent minimum requirements for the radio telephone 40. Those statutory guidelines and regulations which are in

30 preparation must also be taken into account.

The characteristic product quality values established by the management 10 for the radio telephone 40 to be developed may, however, also go beyond the minimum

35 quality requirements and include further characteristic product quality values, such as for example the maximum standby time arising from the energy consumption and the battery capacity of the radio telephone 40 and the resultant maximum possible talk time.

40

Components 42 to 66, which are to be included in the radio telephone 40, are defined on the basis of the established properties and the established characteristic product quality values. In this 5 embodiment, the components 42 to 46 are subassemblies of the radio telephone 40. It is checked whether components which have already been used in other products, such as for example the chip-card reading and writing unit 60, the display unit 50 or the input unit 10 48, can be taken over unmodified for the radio telephone 40. Furthermore, components 42 to 66 to be newly developed or components 42 to 66 to be modified are established. These components 42 to 66 may comprise hardware and/or software components. The 15 manufacturer selection and the verification of the characteristic component quality values take place as already described in the description relating to figure 1.

20 If individual components 42 to 66 of the radio telephone 40 are newly developed or modified, characteristic component quality values of these components 42 to 66 are determined while taking into consideration the further components 42 to 66 of the 25 radio telephone 40. These determined characteristic component quality values are compared with the established characteristic product quality values. If the characteristic component quality values do not satisfy the established characteristic product quality 30 values, these components 42 to 66 are modified and modified characteristic component quality values are determined after the modification. These current modified characteristic component quality values are in turn compared with the established characteristic 35 product quality values. The modification, the determination of the modified characteristic component quality values and the comparison of the modified characteristic quality values with the established characteristic product quality values are repeated

until the characteristic product quality values are at least reached.

5 If the individual components 42 to 66 satisfy the requirements of the established characteristic product quality values, these components 42 to 66 are assembled to form the radio telephone 40. The current characteristic product quality values of this radio telephone 40 are then determined and in turn compared 10 with the characteristic product quality values previously established during planning. If the determined current characteristic product quality values of the radio telephone 40 do not satisfy the established characteristic product quality values, at 15 least one of the components 42 to 66 is modified. Subsequently, the modified characteristic product quality values of the radio telephone 40 are determined and again compared with the established characteristic product quality values. The characteristic product 20 quality values represent desired values and the current determined characteristic component and/or product quality values represent actual values. ~~With the aid of the method according to patent claim 1, a~~ A desired-value/actual-value comparison is carried out in the 25 manner of a control loop. The modification of the respective component 42 to 66 or of the components is the manipulated variable of the control loop. The control is continued until the actual values have at least reached the desired values.

30 The modification and renewed determination of the characteristic product quality values of the radio telephone 40 are repeated until the established characteristic product quality values are at least 35 reached. By meeting the characteristic product quality values, it is ensured that no infringements of applicable regulations, resulting in cost-intensive subsequent improvement of already produced radio telephones 40, occur when the radio telephone 40 is 40 sold in the respective sales region. It is also

ensured that, by taking into consideration the market requirements 12 and the local requirements 16, a radio telephone 40 of a high quality is developed, also corresponding to the specific requirements of the 5 respective sales region and consequently having good prerequisites for achieving successful sales.

Represented in figure 3 is a signal flow diagram of a method of developing a product 20 while taking into 10 consideration quality features to be established of the product 20. In **step S10**, the method is started. In **step S12**, it is checked whether a decision to manufacture a new product 20, for example a radio telephone 40, has been taken, for example by the 15 management 10. If such a decision has been taken, characteristic sales values for the product 20, which take into consideration information on the intended sales regions, the intended markets, the intended customers, in particular the intended sales countries, 20 is defined in **step S14**. Subsequently, in **step S16**, the characteristic product quality values for the product 20 to be developed are established. When establishing the characteristic product quality values, the requirements arising from the characteristic sales 25 values established in **step S14** are taken into consideration. In particular, customer requirements 14, local requirements 16 and applicable guidelines and regulations 18 are taken into consideration.

30 In **step S18**, the components 22 to 30 which are to be included in the product 20 are subsequently defined. Subsequently, in **step S20**, it is checked for each component 22 to 30 whether this component 22 to 30 is to be manufactured by an outside manufacturer. If this 35 is the case, at least one possible manufacturer is established in **step S22** for each component 22 to 30. The manufacturer selection takes place with the aid of what is known as an audit, with criteria which have already been described in the comments relating to 40 figure 1. With the aid of such an audit, the

1 performance capability and suitability of the  
2 manufacturer for manufacturing the respective component  
3 22 to 30 is qualitatively assessed. Such an audit may  
4 take place for example with the aid of a questionnaire,  
5 on which the respective possible manufacturer has to  
provide suitable legally binding information and which  
becomes part of the contract if, for example, an order  
is commissioned.

10 Subsequently, it is checked in ~~step~~ S24 for each  
11 component 22 to 30 whether this component 22 to 30 ~~must~~  
~~should~~ be newly developed or whether an existing  
12 component 22 to 30 ~~must~~ ~~should~~ be modified. The check  
13 in ~~step~~ S24 is also carried out if it has been  
14 established in ~~step~~ S20 that the respective component  
15 22 to 30 is not being manufactured by an outside  
manufacturer but at one's own company.

20 In other exemplary embodiments, in a decision as to  
21 whether the respective component 22 to 30 is to be  
manufactured by an outside manufacturer or at one's own  
22 company it is also possible to assess one's own company  
23 with the aid of the audit, the results of the audit  
24 being used to take the decision on whether the  
25 respective component 22 to 30 is manufactured at one's  
own company or by an outside manufacturer.

30 If it is established in ~~step~~ S24 that the respective  
31 component 22 to 30 is not to be newly developed and not  
to be modified, i.e. that the respective component 22  
32 to 30 already exists and can be taken over unmodified  
for the product 20, it is subsequently checked in ~~step~~  
33 S36 whether the existing characteristic component  
34 quality values also satisfy the established  
35 characteristic product quality values when this  
component 22 to 30 is combined with further components  
22 to 30.

40 If the characteristic component quality values do not  
satisfy the established characteristic product quality

values, this component 22 to 30 is modified and modified current characteristic component quality values are subsequently determined. The determined current modified characteristic component quality 5 values are compared with the established characteristic product quality values, modification of the component 22 to 30 continuing until the characteristic component quality values satisfy the established characteristic product quality values. Once this is the case, the 10 results, i.e. the determined current characteristic component quality values and/or the determined current characteristic product quality values, are documented in the subsequent step S26. The characteristic product quality values represent desired values and the current 15 determined characteristic component and/or product quality values represent actual values. With the current determined characteristic component or product quality values and the established characteristic product quality values, a desired-value/actual-value comparison is carried out in the manner of a control 20 loop. The modification of the respective component or components is the manipulated variable of the control loop. The control is carried out until all the actual values have at least reached the desired values.

25 If, however, it is established in step S24 that the respective component 22 to 30 is to be newly developed or modified, it is subsequently checked in step S28 whether the component 22 to 30 is to be newly 30 developed. If this is the case, the characteristic component quality values of the newly developed component 22 to 30 are subsequently determined in step S30 and compared with the established characteristic product quality values, with effects of the combination 35 of this component 22 to 30 with the further components 22 to 30 of the product 20 being taken into consideration. If the established characteristic product quality values are not reached by the current characteristic component quality values, the respective 40 component 22 to 30 is subsequently improved and

- retested. The subsequent improvement and testing is repeated until all the established characteristic product quality values are at least reached by the current modified characteristic component quality 5 values. Subsequently, in step S26, the possibly modified characteristic component quality values and/or the resulting characteristic product quality values are documented and archived.
- 10 If it is established in step S28 that the respective component 22 to 30 is not a new development, it is checked in step S32 whether the relevant characteristic product quality values can be derived from the characteristic component quality values of the original 15 component. If this is the case, the characteristic component quality values of the modified component 22 to 30 are determined in step S34 from the characteristic component quality values of the original component while taking into consideration influences of 20 the further components 22 to 30, and are subsequently documented and archived in step S26.
- If, however, it is established in step S32 that it is not possible to derive the characteristic component 25 quality values of the modified component 22 to 30 from the characteristic component quality values of the original component, the characteristic component quality values of the modified component 22 to 30 are determined in step S30 and compared with the 30 characteristic product quality values previously established during planning. If the established characteristic product quality values are not at least reached by the determined characteristic component quality values, the respective component 22 to 30 is 35 subsequently improved and modified characteristic component quality values are determined. This operation is repeated until the characteristic component quality values have reached the established characteristic product quality values. Subsequently, 40 in step S26, the determined and possibly modified

characteristic component quality values and the characteristic product quality values arising from the characteristic component quality values are documented and archived. Once checking of all the components 22 to 30 of the product 20 has been completed, furthermore, a certificate showing that the respective quality requirements are met is issued in step S26. The method is subsequently ended in step S38. The method is likewise ended in step S38 if it has been established in step S12 that no new product is to be developed.

The characteristic component quality values and/or the characteristic product quality values should be determined by an accredited test laboratory. For a newly developed or modified component 22 to 30, the manufacturer of the component 22 to 30 may also determine the characteristic component quality values in a non-accredited test laboratory. However, once the respective component 22 to 30 satisfies the established characteristic product quality values, the determined characteristic component quality values should be confirmed by an accredited test laboratory.

Represented in figure 4 is a data processing installation 70, which includes components 72 to 80. The data processing installation 70 has a personal computer 72, which is connected with the aid of data lines (not represented) to a screen 74, a keyboard 76, a computer mouse 78 and to a printer 80. In this exemplary embodiment, there is evidence for each of the components 72 to 80 of the data processing installation 70 that the characteristic product quality values established for the data processing installation 70 are met. For products such as the data processing installation 70 it is not necessary in most sales regions, such as also in Germany for example, to determine the characteristic product quality values of the data processing installation 70. With the aid of the characteristic component quality values of the

components 72 to 80, the manufacturer of the data processing installation 70 can issue certificates showing that the established characteristic product quality values for the data processing insulation 70 5 are met.